TRI-TOWN HEALTH DEPARTMENT
Lee - Lenox – Stockbridge

DATE: October 14, 2021

TO: Lee, Lenox, and Stockbridge Boards of Selectmen

FROM: James J. Wilusz, Tri-Town Boards of Health

CC: Lee, Lenox, and Stockbridge Town Administrators/Managers

RE: Formal Request to Utilize ARPA funds for TTBoH District

Dear Respected Municipal Leaders,

On behalf of the Tri-Town Boards of Health, representing the Lee, Lenox, and Stockbridge Boards of Health and the Tri-Town Health Department, are respectfully requesting your consideration and approval to request funding under the American Recue Plan Act of 2021. Our request aligns with allowable and eligible expenses under **1: Public Health, 1.12: Other Public Health Services.**

We are requesting a total amount of $70,000 per year of available ARPA funds. Our goal is to utilize ARPA funds versus formally requesting this funding through the municipal operating budget. Below is a breakdown utilizing the existing district funding formula based on percentage and a justification and description of how we plan to utilize this funding.

The Tri-Town Health District is seeking to hire a 1.0 FTE full time equivalent employee who is specialized in the FDA National Retail Food Standards Program to assist the district in advancing this national certification and to be federally certified under the program. Once certified, the FDA then invests significant dollars to offset operating costs to continue and maintain this certification. In certain cases, we could be eligible for over $100,000 over a multiyear grant. The ARPA funding would be a short-term investment with a long-term gain.

The FDA Voluntary National Retail Food Regulatory Program Standards (Retail Program Standards) is a program that defines what constitutes a highly effective and responsive food program for the regulations of food service and retail food establishments. The goal of the Retail Program Standards is to guide regulatory programs to reduce or eliminate the occurrence of illnesses and deaths from food produced at the retail level while recognizing that there are different approaches toward achieving that goal.

The FDA Certification while not mandatory now, will be in forthcoming years as the state advances mandatory workforce credentials in Massachusetts under the Special Commission of Local and Regional Public Health Workforce Standards

45 Railroad Street-Lee, MA 01238
Tel: 413-243-5540- Fax: 413-243-5542
Email: info@tritownhealth.org

Here is the breakdown of cost request per town/year:

Annual Request: $70,000

Lee: (33%) $23,100

Lenox: (43%) $30,100

Stockbridge: (24%) 16,800

Thank you for your time and consideration on this important request that will further advance the Health District and its community.

Respectfully,

James J. Wilusz, R.S.
Executive Director of Public Health/Registered Sanitarian
Tri-Town Health Department
Lee, Lenox, and Stockbridge Boards of Health

45 Railroad Street-Lee, MA 01238
Tel: 413-243-5540- Fax: 413-243-5542
Email: info@tritownhealth.org

OLD-GROWTH FOREST NETWORK
Connecting people with nature by creating a national network of protected, mature, native forests

PO Box 21
Easton MD 21601
410-251-1800
oldgrowthforest.net
info@oldgrowthforest.net

October 25, 2021

To: United States Forest Service

I am writing to you as the Northeast Regional Manager of the Old-Growth Forest Network (OGFN). We are a national organization dedicated to the protection and promotion of publicly accessible old-growth, native forests across the country. We work to identify and protect forests to ensure their beauty and biodiversity for future generations.

Through the work of the Stockbridge Massachusetts Agriculture and Forestry Commission and the Town Selectboard, the Ice Glen Forest has recently been added to the Network. Ice Glen is a welcome addition and was chosen as the best example of publicly accessible, protected old growth in Berkshire County. This forest is located within a glacial ravine in the southeastern corner of the state. Its name derives from the fact that ice can persist at the bottom of rock crevices, even in the summer months. The forest here has aged with no significant disturbances and exhibits the classic ecological features of a climax community. Ice Glen is easily accessible from the town and offers a rare and unique window into the beauty, ecosystem diversity and wonder of an undisturbed landscape.

This letter is in support of the Town's request for suppression funding to treat the hemlock woolly adelgid and hemlock elongated scale that are ravaging the ancient hemlock trees. Recent assessments have indicated that without this treatment, these insects are likely to kill the trees in a few years, if not sooner.

Old-growth forests are a state and national treasure. We are asking that you support the Town's efforts to treat and preserve these trees. Thank you for considering this request.

For the Forests,

Sarah RobbGrieco
Northeast Regional Manager
(Printed on 100% recycled or tree-free paper)

Stockbridge-Munsee Community

BAND OF MOHICAN INDIANS

TRIBAL COUNCIL OFFICES

October 20, 2021

Re: Support letter for Ice Glen Hemlock Treatment Project

To Whom it May Concern:

The Stockbridge-Munsee Community are the indigenous peoples of the lands upon with the Town of Stockbridge now resides. The lands are our ancestral lands for thousands of years, as well as during the 18th century in particular when the Town was officially founded for our ancestors as "Indiantown."

Though we now live in Wisconsin and continue to thrive as a sovereign Tribal Nation, our hearts are closely connected with our homelands including Stockbridge and we have a deep interest in cultural and environmental matters affecting our territory. We support the Town of Stockbridge's grant proposal in regard to efforts to preserve the old growth hemlocks in the Ice Glen. The Ice Glen contains trees that our ancestors walked among in the 1700s. Historical evidence shows that some ancestors lived in this forest, and, after serving in the Revolutionary War we buried a hatchet on a hill in the Ice Glen. It is a culturally significant place to our community.

As the original stewards of the forest known as the Ice Glen, we offer our support to the Town's "Ice Glen Hemlock Treatment Project."

Respectfully,

Shannon Holsey
President

P.O. BOX 70 • N8476 MOH HE CON NUCK ROAD • BOWLER, WI 54416 • (715) 793-4111 • FAX (715) 793-1307

Friends of Mohawk Trail State Forest
106 Morningside Drive Florence MA 01062

Oct 10, 2021

To whom it may concern:

My name is Robert T. Leverett, cofounder of both the Native Tree Society and Friends of Mohawk Trail State Forest. I'm the coauthor of *The Sierra Club Guide to Ancient Forests of the Northeast*, as well as of additional books, to include *Eastern Old Growth Forests: Prospects for Rediscovery and Recovery*. My other relevant titles are: Senior Advisor to the American Forests National Champion Trees program, and Chair of the Massachusetts Department of Conservation and Recreation's Forest Reserve Science Advisory Committee.

Since the late 1980s, I've been involved in identifying and documenting old growth forest remnants in the eastern United States, and Massachusetts in particular. In the early 1990s, I began visiting a property named Ice Glen, owned by the town of Stockbridge. I quickly learned of its long and distinguished cultural history, and even its tie to Herman Melville's *Moby-Dick*.

What originally drew me to the 'Icey Glen', as Melville called it, was its 25 acres of old-growth forest that are embedded in a larger area of very mature regrowth woodlands, featuring some of the largest white pines, hemlocks, and white ashes in the state. I soon came to recognize the Glen as a real gem: historically, culturally, ecologically, aesthetically, and for some, spiritually. Unfortunately, its stately hemlocks are suffering from elongate hemlock scale, hemlock looper moths, and hemlock woolly adelgid.

The Town of Stockbridge has developed a plan to treat the hemlocks with Dinotefuran. The proposal has been designed by professionals and concentrates on the trees needing treatment, and capable of being saved. I am in full support of this plan. If the hemlocks are not treated, historic Ice Glen's iconic old-growth forest will be irreparably damaged.

I should point out that Ice Glen's old-growth hemlocks range in age from 200 to 400 years. Some of these venerable old trees started life before the settlement of the area, first by Mohican Indians, and later by people of European descent. Beyond their advanced ages, these are some of New England's tallest hemlocks, with one in the center of the Glen reaching a surprising height of 136 feet - number one in New England. Other hemlocks reach to between 120 and 130 feet as measured with laser hypsometers. Their great size and unsurpassed heights impart the deep woods ambience that all feel.

Over the years, I have observed many hundreds of people stroll through the Glen, gazing aloft and falling under its magical spell, and I've led numerous groups of people anxious to learn about the old growth. I've never seen anyone leave disappointed. At Ice Glen, elements of history, culture, and nature come together in this one place. Its value goes beyond the local level to represent a State treasure, and dare I say, a national one. Please help us to preserve it for ourselves and our posterity.

Sincerely,

Robert T. Leveret

359	42.276195	-73.304595	Ash	32.1	1
360	42.276257	-73.304663	Hemlock	13.5	3
361	42.276306	-73.30458	Ash	20.9	1
362	42.27637	-73.304561	Hemlock	16.6	3
363	42.276342	-73.304677	Hemlock	28.7	3
364	42.276451	-73.304796	Hemlock	14.9	3
365	42.276696	-73.305265	Ash	25.3	1
366	42.276651	-73.305284	Hemlock	21.2	3
367	42.276747	-73.305345	Ash	32.1	1
368	42.276652	-73.305335	Hemlock	20.2	3
369	42.27689	-73.305046	Hemlock	15.4	3
370	42.276978	-73.304976	Hemlock	20.0	3
371	42.276872	-73.304927	Ash	44.0	1
372	42.276941	-73.305584	Ash	21.4	1
373	42.276934	-73.305615	Hemlock	17.5	3
374	42.276999	-73.305506	Ash	28.5	1
375	42.277027	-73.305623	Ash	20.5	1
376	42.277096	-73.305636	Ash	21.4	1
377	42.277197	-73.305452	Ash	31.3	1
378	42.277419	-73.305561	Ash	32.5	1
379	42.27741	-73.305538	Hemlock	25.1	3
380	42.27743	-73.305524	Ash	27.4	1
381	42.277464	-73.305762	Ash	27.0	1
382	42.277511	-73.30599	Ash	28.0	1
383	42.277502	-73.30625	Ash	33.1	1
				Avg DBH: 23.1	Avg Health: 2.51

319	42.274481	-73.306273	Ash	18.6	1
320	42.274479	-73.306355	Ash	13.6	1
321	42.274374	-73.30642	Ash	18.4	1
322	42.274364	-73.306549	Ash	35.0	1
323	42.274413	-73.306556	Hemlock	23.7	2
324	42.274333	-73.306764	Hemlock	21.2	3
325	42.274319	-73.306711	Hemlock	31.3	2
326	42.274237	-73.306599	Hemlock	25.3	2
327	42.274277	-73.306548	Hemlock	15.5	3
328	42.274279	-73.306566	Hemlock	14.5	3
329	42.274293	-73.306564	Hemlock	17.2	3
330	42.274357	-73.306572	Hemlock	17.2	3
331	42.274031	-73.306417	Hemlock	28.7	3
332	42.273808	-73.306762	Hemlock	24.2	3
333	42.273645	-73.306854	Hemlock	22.0	3
334	42.273587	-73.307006	Hemlock	31.0	2
335	42.273665	-73.307062	Hemlock	21.5	3
336	42.274524	-73.306199	Ash	33.5	1
337	42.274627	-73.306406	Ash	36.2	1
338	42.274801	-73.306377	Hemlock	33.9	2
339	42.274887	-73.306425	Hemlock	20.0	3
340	42.274991	-73.30633	Ash	42.1	1
341	42.275021	-73.306304	Hemlock	17.7	3
342	42.275028	-73.306418	Ash	34.2	1
343	42.274986	-73.306559	Hemlock	27.3	3
344	42.275111	-73.30668	Hemlock	30.2	2
345	42.275237	-73.306539	Hemlock	37.4	2
346	42.275112	-73.306446	Hemlock	32.0	2
347	42.275049	-73.306106	Hemlock	34.2	2
348	42.274818	-73.306149	Ash	33.0	1
349	42.275103	-73.30604	Hemlock	18.4	3
350	42.275148	-73.306055	Hemlock	28.5	3
351	42.275213	-73.306079	Hemlock	20.0	3
352	42.275304	-73.306035	Hemlock	18.0	3
353	42.275336	-73.306053	Ash	25.6	1
354	42.275618	-73.305648	Ash	31.2	2
355	42.275719	-73.305273	Ash	25.6	1
356	42.275786	-73.30536	Hemlock	15.6	3
357	42.275772	-73.304867	Hemlock	32.9	2
358	42.27587	-73.304767	Ash	22.2	2

279	42.273773	-73.307398	Hemlock	24.9	3
280	42.273883	-73.307468	Hemlock	27.0	3
281	42.273892	-73.30738	Hemlock	23.9	3
282	42.273912	-73.307346	Hemlock	27.1	3
283	42.273901	-73.307323	Hemlock	30.9	3
284	42.273871	-73.307215	Hemlock	32.1	3
285	42.273867	-73.307156	Hemlock	15.5	3
286	42.273807	-73.307083	Hemlock	13.0	3
287	42.273958	-73.307116	Hemlock	23.2	3
288	42.274054	-73.307151	Hemlock	25.5	3
289	42.274069	-73.30722	Hemlock	19.2	3
290	42.273913	-73.30731	Hemlock	20.2	3
291	42.274059	-73.307171	Hemlock	25.7	3
292	42.274117	-73.307134	Hemlock	29.3	3
293	42.274107	-73.306996	Hemlock	33.4	3
294	42.274155	-73.307052	Hemlock	17.1	3
295	42.27419	-73.307113	Hemlock	23.5	3
296	42.2741	-73.307197	Hemlock	26.2	3
297	42.274214	-73.30727	Hemlock	28.7	3
298	42.274307	-73.307196	Hemlock	23.5	3
299	42.274195	-73.307028	Hemlock	19.7	3
300	42.274286	-73.307109	Hemlock	16.0	3
301	42.274387	-73.30705	Hemlock	19.2	3
302	42.274374	-73.306899	Hemlock	18.5	3
303	42.274443	-73.306853	Hemlock	22.2	3
304	42.274509	-73.306797	Hemlock	16.2	3
305	42.274473	-73.306915	Hemlock	20.3	3
306	42.274541	-73.306973	Hemlock	18.4	3
307	42.274521	-73.306924	Hemlock	15.1	3
308	42.27457	-73.307023	Hemlock	24.3	2
309	42.274538	-73.30714	Hemlock	22.5	2
310	42.274574	-73.30678	Hemlock	21.5	3
311	42.27468	-73.306813	Hemlock	19.2	3
312	42.274727	-73.306668	Hemlock	30.8	3
313	42.274779	-73.306709	Hemlock	19.4	3
314	42.274643	-73.30663	Hemlock	25.5	2
315	42.274653	-73.306555	Hemlock	15.4	2
316	42.274559	-73.306477	Hemlock	18.0	2
317	42.274559	-73.306572	Hemlock	16.0	3
318	42.274478	-73.306352	Hemlock	215.0	3

239	42.273487	-73.307363	Hemlock	18.9	3
240	42.273533	-73.307449	Hemlock	18.2	3
241	42.27345	-73.307579	Hemlock	18.5	3
242	42.273395	-73.307584	Hemlock	24.0	3
243	42.273434	-73.307454	Hemlock	19.4	3
244	42.273346	-73.307588	Hemlock	19.1	3
245	42.273331	-73.307783	Hemlock	16.2	3
246	42.273309	-73.307788	Hemlock	16.5	3
247	42.273441	-73.307771	Hemlock	18.3	3
248	42.273479	-73.307711	Hemlock	21.2	3
249	42.273574	-73.30764	Hemlock	15.7	3
250	42.273483	-73.307603	Hemlock	16.6	3
251	42.273556	-73.307571	Hemlock	21.9	3
252	42.27358	-73.307523	Hemlock	19.5	3
253	42.273656	-73.307527	Hemlock	14.8	3
254	42.273685	-73.307562	Hemlock	19.0	3
255	42.273625	-73.30771	Hemlock	22.0	3
256	42.273553	-73.307654	Hemlock	22.2	3
257	42.273555	-73.307741	Hemlock	22.6	3
258	42.273655	-73.307741	Hemlock	22.6	3
259	42.27366	-73.307745	Hemlock	18.3	3
260	42.273636	-73.307521	Hemlock	14.9	3
261	42.273597	-73.307382	Hemlock	22.4	3
262	42.27362	-73.307362	Hemlock	18.8	3
263	42.273643	-73.307267	Hemlock	23.9	3
264	42.273702	-73.3074	Hemlock	15.0	3
265	42.273711	-73.307373	Hemlock	15.6	3
266	42.273687	-73.307205	Hemlock	26.8	2
267	42.273598	-73.307154	Hemlock	20.6	3
268	42.273567	-73.3071	Hemlock	20.6	3
269	42.273561	-73.307121	Hemlock	24.7	3
270	42.273544	-73.307118	Hemlock	23.8	3
271	42.273453	-73.306952	Hemlock	19.0	3
272	42.273384	-73.30708	Hemlock	17.0	3
273	42.273545	-73.307064	Hemlock	14.1	3
274	42.273622	-73.307094	Hemlock	24.1	2
275	42.273696	-73.3072	Hemlock	23.5	3
276	42.273775	-73.307279	Hemlock	32.3	3
277	42.273792	-73.307303	Hemlock	21.6	3
278	42.273717	-73.307349	Hemlock	24.3	3

199	42.274883	-73.305748	Hemlock	19.8	3
200	42.275012	-73.3059	Hemlock	29.9	3
201	42.274954	-73.306048	Hemlock	38.2	2
202	42.276078	-73.304785	Hemlock	43.5	2
203	42.276541	-73.304367	Hemlock	26.7	2
204	42.276584	-73.304502	Hemlock	17.8	3
205	42.276579	-73.304758	Hemlock	21.2	3
206	42.276752	-73.305168	Ash	46.7	1
207	42.428449	-72.941568	Hemlock	12.6	3
208	42.428449	-72.941568	Hemlock	28.2	3
209	42.272641	-73.307216	Hemlock	17.4	3
210	42.272447	-73.307457	Hemlock	23.3	2
211	42.272368	-73.307429	Hemlock	19.5	3
212	42.272423	-73.307532	Hemlock	17.7	2
213	42.272375	-73.307526	Hemlock	14.5	3
214	42.272467	-73.307523	Hemlock	17.0	3
215	42.272562	-73.307543	Hemlock	19.3	3
216	42.27261	-73.307646	Hemlock	19.1	3
217	42.272639	-73.307615	Hemlock	14.1	3
218	42.272631	-73.307529	Hemlock	26.2	3
219	42.272463	-73.307577	Hemlock	15.5	3
220	42.272465	-73.30732	Hemlock	16.1	3
221	42.2724	-73.307231	Hemlock	25.0	3
222	42.272642	-73.307325	Hemlock	25.1	3
223	42.272739	-73.307356	Hemlock	16.0	3
224	42.272662	-73.307412	Hemlock	26.3	3
225	42.272893	-73.307306	Hemlock	38.1	2
226	42.272953	-73.307342	Hemlock	26.2	3
227	42.272916	-73.307255	Hemlock	39.2	3
228	42.272968	-73.307478	Hemlock	21.8	3
229	42.272911	-73.307591	Hemlock	22.7	3
230	42.272871	-73.307691	Hemlock	25.9	3
231	42.27306	-73.307693	Hemlock	17.6	3
232	42.273122	-73.307556	Hemlock	13.0	3
233	42.273084	-73.307244	Hemlock	30.6	2
234	42.273221	-73.307228	Hemlock	25.2	3
235	42.273318	-73.307169	Hemlock	17.3	3
236	42.273372	-73.307253	Hemlock	25.1	3
237	42.273411	-73.307243	Hemlock	17.9	3
238	42.27348	-73.307313	Hemlock	21.9	3

159	42.274686	-73.305759	Hemlock	21.3	2
160	42.274707	-73.305871	Hemlock	25.1	2
161	42.274824	-73.305942	Hemlock	23.5	2
162	42.27485	-73.305915	Hemlock	31.0	2
163	42.274751	-73.305927	Hemlock	18.7	3
164	42.274656	-73.305992	Hemlock	27.2	2
165	42.27463	-73.306043	Hemlock	17.4	2
166	42.274796	-73.306015	Hemlock	19.1	3
167	42.274852	-73.306048	Hemlock	31.6	2
168	42.274869	-73.306061	Hemlock	24.4	2
169	42.27496	-73.306006	Hemlock	29.4	2
170	42.27498	-73.305954	Hemlock	26.3	2
171	42.274825	-73.305725	Hemlock	21.6	3
172	42.274857	-73.305702	Hemlock	22.0	3
173	42.27487	-73.305598	Hemlock	29.1	2
174	42.274956	-73.305631	Hemlock	19.1	2
175	42.274959	-73.305659	Hemlock	24.2	2
176	42.275064	-73.305621	Hemlock	26.3	2
177	42.275005	-73.30554	Hemlock	28.4	2
178	42.274888	-73.305541	Hemlock	22.0	2
179	42.27501	-73.305484	Hemlock	20.6	3
180	42.275072	-73.305394	Hemlock	25.8	2
181	42.275113	-73.305352	Hemlock	17.9	3
182	42.275124	-73.305218	Hemlock	25.3	2
183	42.27513	-73.305325	Ash	27.8	1
184	42.275305	-73.305223	Hemlock	16.0	2
185	42.275336	-73.305379	Hemlock	32.7	2
186	42.275528	-73.305621	Ash	33.1	1
187	42.2753	-73.305863	Hemlock	23.2	2
188	42.275312	-73.305802	Ash	24.4	1
189	42.275246	-73.305658	Hemlock	16.2	2
190	42.275175	-73.305751	Hemlock	23.1	2
191	42.275201	-73.305824	Hemlock	21.1	2
192	42.275192	-73.305934	Hemlock	17.1	3
193	42.27504	-73.305755	Hemlock	26.5	2
194	42.2751	-73.305622	Hemlock	25.8	2
195	42.275142	-73.305613	Hemlock	25.1	2
196	42.275042	-73.305811	Hemlock	19.9	2
197	42.275027	-73.305947	Hemlock	24.1	3
198	42.274959	-73.305817	Hemlock	20.6	3

119	42.27336	-73.306695	Hemlock	20.3	3
120	42.273319	-73.30655	Hemlock	16.9	2
121	42.273294	-73.306731	Hemlock	17.6	3
122	42.273285	-73.306779	Hemlock	13.0	3
123	42.273385	-73.306829	Hemlock	17.6	3
124	42.273164	-73.306936	Hemlock	21.6	3
125	42.273276	-73.306839	Hemlock	25.5	3
126	42.273182	-73.307119	Hemlock	35.1	2
127	42.27323	-73.307004	Hemlock	18.2	2
128	42.273184	-73.307087	Hemlock	21.0	3
129	42.27365	-73.306724	Hemlock	19.3	3
130	42.273721	-73.30669	Hemlock	21.0	3
131	42.273711	-73.306719	Hemlock	25.6	3
132	42.27359	-73.306672	Hemlock	20.5	2
133	42.273609	-73.306735	Hemlock	23.5	2
134	42.273521	-73.306768	Hemlock	14.6	3
135	42.273489	-73.306864	Hemlock	16.2	3
136	42.273723	-73.306456	Hemlock	15.5	3
137	42.273693	-73.306372	Hemlock	14.5	3
138	42.27373	-73.30629	Hemlock	20.9	3
139	42.273721	-73.306149	Hemlock	18.2	3
140	42.273753	-73.3064	Hemlock	19.1	3
141	42.273979	-73.306283	Ash	27.7	1
142	42.273954	-73.306253	Hemlock	34.1	2
143	42.273903	-73.306089	Hemlock	19.7	2
144	42.273953	-73.306038	Hemlock	20.6	2
145	42.274048	-73.306041	Hemlock	23.2	2
146	42.274091	-73.306077	Hemlock	16.5	2
147	42.274002	-73.305971	Hemlock	34.9	2
148	42.274033	-73.306013	Hemlock	21.6	2
149	42.274014	-73.30598	Hemlock	17.2	2
150	42.273914	-73.305911	Hemlock	30.8	2
151	42.274221	-73.305967	Hemlock	15.1	2
152	42.27425	-73.306123	Hemlock	15.2	2
153	42.274212	-73.306129	Hemlock	24.2	2
154	42.27436	-73.306004	Hemlock	16.9	3
155	42.274424	-73.305941	Hemlock	27.4	2
156	42.274557	-73.305888	Hemlock	27.0	3
157	42.274627	-73.305782	Hemlock	17.3	2
158	42.274651	-73.305926	Hemlock	20.7	2

079	42.272681	-73.307221	Hemlock	22.3	2
080	42.272966	-73.307134	Hemlock	29.0	3
081	42.273036	-73.307268	Hemlock	28.3	3
082	42.272965	-73.30718	Hemlock	32.3	2
083	42.272944	-73.307304	Hemlock	20.9	2
084	42.273074	-73.30698	Hemlock	30.6	3
085	42.27289	-73.30686	Hemlock	23.7	3
086	42.272952	-73.306868	Hemlock	18.5	3
087	42.273014	-73.306921	Hemlock	23.1	2
088	42.27309	-73.306818	Hemlock	16.8	3
089	42.273112	-73.306879	Hemlock	15.8	3
090	42.27319	-73.306782	Hemlock	20.2	2
091	42.273229	-73.306748	Hemlock	21.4	3
092	42.273154	-73.306667	Hemlock	20.8	3
093	42.273295	-73.306704	Hemlock	15.7	3
094	42.273249	-73.306614	Hemlock	21.0	2
095	42.273209	-73.306555	Hemlock	27.4	3
096	42.273274	-73.306565	Hemlock	23.7	3
097	42.273318	-73.306444	Hemlock	24.4	2
098	42.273333	-73.306401	Hemlock	22.8	2
099	42.273344	-73.306428	Hemlock	16.2	3
100	42.2734	-73.306388	Hemlock	18.0	3
101	42.273501	-73.306399	Hemlock	24.1	2
102	42.273537	-73.306505	Hemlock	19.6	2
103	42.273585	-73.306436	Hemlock	21.6	2
104	42.273557	-73.306293	Hemlock	19.5	2
105	42.273597	-73.306316	Hemlock	24.3	2
106	42.273594	-73.306333	Hemlock	14.2	3
107	42.273655	-73.306357	Hemlock	12.6	3
108	42.273672	-73.306375	Hemlock	16.4	2
109	42.273637	-73.306333	Hemlock	15.9	3
110	42.273625	-73.306321	Hemlock	15.0	3
111	42.273474	-73.306549	Hemlock	21.0	3
112	42.273542	-73.306582	Hemlock	23.4	2
113	42.273623	-73.306464	Hemlock	22.3	2
114	42.273668	-73.306467	Hemlock	21.5	2
115	42.273573	-73.306608	Hemlock	20.0	2
116	42.273498	-73.306614	Hemlock	19.5	3
117	42.273467	-73.306673	Hemlock	16.7	3
118	42.273436	-73.30667	Hemlock	25.6	3

039	42.271999	-73.307675	Hemlock	34.1	2
040	42.272057	-73.307576	Hemlock	31.0	2
041	42.272071	-73.307568	Hemlock	33.1	2
042	42.272066	-73.307328	Hemlock	17.9	3
043	42.272099	-73.307323	Hemlock	18.8	3
044	42.272043	-73.307275	Hemlock	14.9	3
045	42.272147	-73.307341	Hemlock	24.8	2
046	42.272263	-73.307315	Hemlock	20.5	3
047	42.272209	-73.307293	Hemlock	20.6	3
048	42.272286	-73.307233	Hemlock	14.5	3
049	42.272249	-73.307211	Hemlock	16.0	3
050	42.272265	-73.307337	Hemlock	10.0	3
051	42.428448	-72.941593	Hemlock	14.6	3
052	42.272126	-73.307299	Hemlock	20.6	3
053	42.272131	-73.307287	Hemlock	20.6	3
054	42.27202	-73.307357	Hemlock	16.4	3
055	42.272299	-73.307284	Hemlock	16.4	3
056	42.272194	-73.307059	Hemlock	24.8	3
057	42.272237	-73.306892	Hemlock	31.4	3
058	42.272178	-73.306949	Hemlock	22.6	3
059	42.272164	-73.30672	Hemlock	25.5	3
060	42.272255	-73.30669	Hemlock	19.4	3
061	42.272272	-73.306741	Hemlock	28.2	3
062	42.272141	-73.306918	Hemlock	23.0	3
063	42.272286	-73.306815	Hemlock	21.3	3
064	42.272376	-73.30668	Hemlock	20.9	3
065	42.272334	-73.306685	Hemlock	16.7	3
066	42.272252	-73.306879	Hemlock	36.5	3
067	42.272498	-73.30672	Hemlock	25.5	3
068	42.272486	-73.306812	Hemlock	26.5	3
069	42.272401	-73.306889	Hemlock	29.1	2
070	42.272338	-73.306975	Hemlock	15.6	3
071	42.272329	-73.306827	Hemlock	22.2	3
072	42.272459	-73.307231	Hemlock	40.2	3
073	42.272506	-73.306972	Hemlock	21.6	2
074	42.272638	-73.306959	Hemlock	34.2	3
075	42.272673	-73.307038	Hemlock	19.7	3
076	42.272635	-73.307073	Hemlock	27.5	3
077	42.272781	-73.306904	Hemlock	29.9	2
078	42.272724	-73.307131	Hemlock	16.6	3

ICE GLEN TREE SURVEY DATA 2021

TREE #	LATITUDE	LONGITUDE	SPECIES	DBH	HEALTH
001	42.271741	-73.30788	Hemlock	31.1	2
002	42.271691	-73.30824	Hemlock	20.9	2
003	42.271687	-73.308294	Hemlock	21.4	2
004	42.271734	-73.308319	Hemlock	22.8	2
005	42.271775	-73.308178	Hemlock	17.9	2
006	42.271758	-73.308202	Hemlock	24.7	2
007	42.27182	-73.308151	Hemlock	15.8	2
008	42.271796	-73.307872	Hemlock	21.9	2
009	42.271922	-73.307821	Hemlock	22.0	2
010	42.271948	-73.307902	Hemlock	32.2	2
011	42.271929	-73.307808	Hemlock	15.8	3
012	42.271985	-73.307908	Hemlock	20.5	2
013	42.271929	-73.307893	Hemlock	14.2	2
014	42.27206	-73.308022	Hemlock	20.1	2
015	42.272089	-73.30803	Hemlock	16.4	3
016	42.272119	-73.308052	Hemlock	19.5	3
017	42.272228	-73.308023	Hemlock	18.0	3
018	42.272308	-73.30797	Hemlock	17.0	3
019	42.272337	-73.307852	Hemlock	25.1	2
020	42.272422	-73.307944	Hemlock	21.2	2
021	42.272492	-73.307835	Hemlock	31.1	2
022	42.272394	-73.307744	Hemlock	19.2	2
023	42.272408	-73.307714	Hemlock	17.2	3
024	42.272508	-73.307761	Hemlock	19.2	2
025	42.27233	-73.307577	Hemlock	18.9	2
026	42.272307	-73.307759	Hemlock	17.1	2
027	42.272309	-73.30769	Hemlock	18.0	2
028	42.27228	-73.307709	Hemlock	15.1	2
029	42.272236	-73.30768	Hemlock	18.4	2
030	42.272211	-73.307743	Hemlock	22.1	3
031	42.272257	-73.307806	Hemlock	18.8	3
032	42.27209	-73.307776	Hemlock	17.8	3
033	42.272164	-73.307729	Hemlock	14.4	3
034	42.272141	-73.307681	Hemlock	22.4	2
035	42.272121	-73.307783	Hemlock	28.2	2
036	42.271992	-73.307793	Hemlock	26.4	3
037	42.271836	-73.307675	Hemlock	30.1	2
038	42.271882	-73.307592	Hemlock	42.5	1

Cultural Control: Because birds, squirrels and deer are important dispersal agents, any effort to discourage these animals from visiting host trees—such as removing bird feeders in the spring and summer—will reduce the risk of those trees becoming infested. Care should also be taken when moving any host material from infested areas onto uninfested property.

Maintaining good growing conditions can play an important role in the survival of infested trees. During periods of drought, important ornamental trees should be watered to ensure that they receive 1 inch of water per week (including rainfall) over the area beneath the dripline of the crown. Apply water slowly to allow uptake by the tree. Pruning and reducing crowding of target trees may encourage new shoot growth and help support vigor. Although fertilizer may improve the growth and vigor of uninfested trees, the added nitrogen also enhances scale survival and reproduction—***do not fertilize host trees in or near scale infested areas.***

Chemical Control: Chemical control is an important part of managing the health of EHS infested ornamentals. It is important to understand that periodic treatments will be necessary over the life of the infested tree to maintain its health and value as an ornamental. The initial decision of whether to use chemicals should weigh the value of the trees relative to the anticipated cost of long term treatments. Consider identifying individual trees or groups of trees that have special value or significance on the property and concentrating control efforts on those trees. Several pesticides are registered for control of EHS. Some are available for homeowner use, while others are available for commercial use only by a licensed pesticide applicator. Horticultural oils can be sprayed on the foliage but penetrating the scale and attaining complete coverage can be difficult. Oils may also kill natural predators leading to heavier populations of scale and other damaging insects such as spider mites. Systemic insecticides with the active ingredient dinotefuran can be effective when applied as a spray on the stem. Systemic insecticides with the active ingredient imidacloprid can also be applied as a soil drench or soil injection but may be less effective.

Caution: For your own protection and that of the environment, apply pesticides only in strict accordance with laws, labels and precautions. Special care should be taken near water when using these pesticides.

More information on Forest Pests in NH: http://nhdfl.org/forest-health/

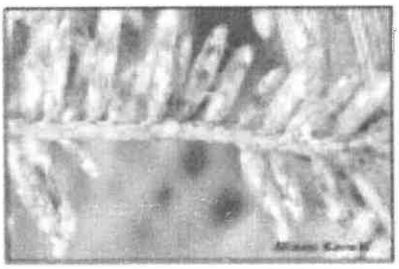
PEST ALERT

State of New Hampshire
Department of Resources and Economic Development
Division of Forests and Lands
Forest Protection Bureau–Forest Health Section

ELONGATE HEMLOCK SCALE
Fiornia externa

Elongate hemlock scale (EHS) is an exotic scale insect that prefers to feed on hemlock, spruce and fir. Cedar, Pine and Yew have also been found infested, but usually only if adjacent to preferred hosts. This insect was introduced to New York in 1908 from Japan and has since spread north to Maine and south to North Carolina. Left untreated EHS can kill trees within 10 years. EHS can also be found on trees infested with Hemlock Woolly Adelgid (HWA). EHS populations build slowly on healthy trees but more quickly on trees that are stressed by HWA, drought, or other factors.

Description: This insect can be recognized by the presence of dry crusty yellowish-brown (female) or white (male) elongated scales and a white woolly substance similar to HWA. EHS attaches to the needles while HWA attaches at the base of the needles on the stem.



Elongate Hemlock Scale

Hemlock Woolly Adelgid

Life Cycle: EHS completes two generations a year in southern states but typically only one in the northeast. Adult females are soft-bodied, legless and wingless and lay roughly 20 eggs under a scale cover. Hatched crawlers settle on the lower surface of young hemlock needles to feed. First and second-stage nymphs secrete a cover as they grow and molt. Second-stage females molt into an adult feeding stage while second-stage males molt into a non-feeding prepupa and spin a cocoon before pupating into an adult. Adult males have legs and wings but do not feed and die soon after mating.

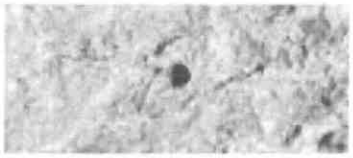


Figure 4. D-shaped exit holes where adult beetles emerged.

Figure 5. Jagged holes left by woodpeckers

Figure 6. Much of the canopy is dead on a heavily infested ash tree

Distribution and Hosts

The emerald ash borer is native to Asia and is known to occur in China, Korea, Japan, Mongolia, the Russian Far East and Taiwan. A Chinese report indicates high populations of the borer occur primarily in *Fraxinus chinensis* and *F. rhynchophylla* forests. Other reported hosts in Asia include *F. mandshurica* var. *japonica*, *Ulmus davidiana* var. *japonica*, *Juglans mandshurica* var. *sieboldiana* and *Pterocarya rhoifolia*. In North America, this borer has only attacked ash trees. Green ash (*F. pennsylvanica*), white ash (*F. americana*) and black ash (*F. nigra*), as well as several horticultural varieties of ash have been killed.

Symptoms

It is difficult to detect emerald ash borer in newly infested trees. Jagged holes excavated by woodpeckers feeding on pre-pupal larvae may be the first sign that a tree has become infested (Fig. 5). When a tree has been infested for at least one year, the D-shaped exit holes left by emerging adults will be present on the branches and the trunk (Fig 4). Bark may split vertically above larval feeding galleries. When the bark is removed from infested trees, the distinct, frass-filled larval tunnels that etch the outer sapwood and phloem are readily visible on the trunk and branches (Fig. 1). An elliptical area of discolored sapwood, usually a result of secondary infection by fungal pathogens, sometimes surrounds larval feeding galleries.

Serpentine tunnels excavated by feeding larvae interrupt the transport of nutrients and water within the tree during the summer. Foliage wilts and the tree canopy becomes increasingly thin and sparse as branches die. Many trees appear to lose about 30% to 50% of the canopy after 2 years of infestation and trees often die after 3-4 years of infestation (Fig. 6). Epicormic shoots may arise on the trunk of the tree, often at the margin of live and dead tissue. Dense root sprouting sometimes occurs after trees die.

Emerald ash borer has killed trees of various size and condition in Michigan. Larvae have developed in trees and branches ranging from 2.5 cm (1 inch) to 140 cm (55 inches) in diameter. Stress likely contributes to the vulnerability and rapid decline of infested ash trees. However, emerald ash borer has killed apparently vigorous trees in woodlots and urban trees under regular irrigation and fertilization regimes.

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Jendek, E. 2002. Agrilus planipennis fact sheet. PDF file provided by Eduardo Jendek, Institute of Zoology, Slovak Academy of Sciences, Bratislava, Slovak Republic.

Resources

Visit the following websites for information on emerald ash borer biology, identification, management, quarantines and related topics:

1. Michigan Multi-Agency Emerald Ash Borer Web Site: http://www.emeraldashborer.info
2. USDA Forest Service: http://www.na.fs.fed.us/pubs/fidls/
3. Michigan Department of Agriculture: http://www.michigan.gov/emeraldashborer

Contact your State Department of Agriculture, State Forester or County Extension Office for more information.

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Photo credits:

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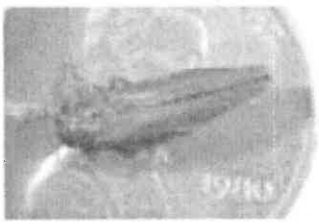
Newtown Square, PA

Pest Alert

United States
Department of Agriculture
Forest Service
State and Private Forestry
Northeastern Area

NA-PR-02-04
January 2004

Emerald Ash Borer



An exotic beetle from Asia was discovered in July 2002 feeding on ash (*Fraxinus* spp.) trees in southeastern Michigan. It was identified as *Agrilus planipennis* Fairmaire (Coleoptera: Buprestidae). Larvae feed in the cambium between the bark and wood, producing galleries that eventually girdle and kill branches and entire trees. Evidence suggests that *A. planipennis* has been established in Michigan for at least six to ten years. More than 3000 square miles in southeast Michigan are infested and more than 5 million ash trees are dead or dying from this pest. This exotic pest is also established in Windsor, Ontario, Canada. In 2003, newly established populations were detected in other areas of southern Michigan and several locations in Ohio. Infested ash nursery trees were also found in Maryland and Virginia.

Identification

Adult beetles are generally larger and a brighter green than the native North American species of *Agrilus* (Fig. 1). Adults are slender, elongate and 7.5 to 13.5 mm long. Males are smaller than females and have fine hairs on the ventral side of the thorax, which the females lack. Color varies but adults are usually bronze or golden green overall, with darker, metallic, emerald green wing covers. The top of the abdomen under the wings is metallic purplish red and can be seen when the wings are spread. The prothorax, the segment behind the head to which the first pair of legs is attached, is slightly wider than the head but the same width as the base of the wing covers.

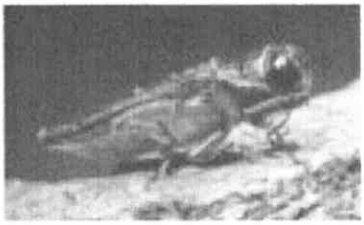


Figure 1. Adult emerald ash borer.

Larvae reach a length of 26 to 32 mm, are white to cream-colored and dorsoventrally flattened (Fig. 2). The brown head is mostly retracted into the prothorax and only the mouth-parts are visible externally. The 10-segmented abdomen has a pair of brown, pincer-like appendages on the last segment.

Figure 2. Second, third, and fourth stage larvae.

Biology

The emerald ash borer generally has a one-year life cycle in southern Michigan but could require two years to complete a generation in colder regions. In 2003, adult emergence began in early June, peaked in late June and early July, and continued into late July. Beetles usually live for about 3 weeks and are present into mid-August. Adult beetles are active during the day, particularly when conditions are warm and sunny. Most beetles remain in protected locations in bark crevices or on foliage during rain, heavy cloud cover, high winds, or temperatures above 32°C (90°F). Beetles feed on ash foliage, usually in small, irregularly shaped patches along the margins of leaves.

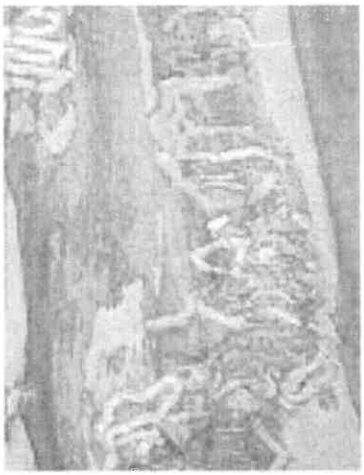


Figure 3. Galleries excavated by larvae.

Females can mate multiple times and egg laying begins a few days after the initial mating. Females can lay at least 60 to 90 eggs during their lifetime. Eggs are deposited individually in bark crevices on the trunk or branches. Eggs hatch in 7 to 10 days.

After hatching, first instar larvae chew through the bark and into the cambial region. Larvae feed on phloem and the outer sapwood for several weeks. The S-shaped feeding gallery winds back and forth, becoming progressively wider as the larva grows (Fig. 3). Galleries are packed with frass, sawdust-like mass. Individual galleries often extend over an area that is 20 to 30 cm in length, though the length of the affected area can range from 10 to 50 cm or longer.

Feeding is completed in autumn and pre-pupal larvae overwinter in shallow chambers excavated in the outer sapwood or in the bark on thick-barked trees. Pupation begins in late April or May. Newly eclosed adults often remain in the pupal chamber for 1 to 2 weeks before emerging head-first through a D-shaped exit hole that is 3–4 mm in diameter (Fig. 4).

Figure 2.—Hemlock woolly adelgid nymphs in dormancy.

Figure 3.—Chemical treatment using the soil injection method.

twig tissue and remain at that location throughout the remainder of their development. Unlike closely related insects that feed on nutrients in sap, the hemlock woolly adelgid feeds on stored starches. These starch reserves are critical to the tree's growth and long-term survival.

Dispersal and movement of hemlock woolly adelgid occur primarily during the first instar crawler stage as a result of wind and by birds, deer, and other forest-dwelling mammals that come in contact with the sticky ovisacs and crawlers. Isolated infestations and long-distance movement of hemlock woolly adelgid, though most often occur as the result of people transporting infested nursery stock.

Control

Cultural, regulatory, chemical, and biological controls can reduce the hemlock woolly adelgid's rate of spread and protect individual trees. Actions such as moving bird feeders away from hemlocks and removing isolated infested trees from a woodlot can help prevent further infestations. State quarantines help prevent the movement of infested materials into noninfested areas.

Chemical control options, such as foliar sprays using horticultural oils and insecticidal soaps, are effective when trees can be saturated to ensure that the insecticide comes in contact with the adelgid. Several systemic insecticides have also proven effective on large trees when applied to the soil around the base of the tree or injected directly into the stem (figure 3). Chemical control is limited to individual tree treatments in readily accessible, nonenvironmentally sensitive areas; it is not feasible in forests, particularly when large numbers of trees are infested. Chemical treatments offer a short-term solution, and applications may need to be repeated in subsequent years.

Figure 4.—Predators introduced for control in the Eastern United States, left to right (origin): *Sasajiscymnus tsugae* (Japan); *Scymnus sinuanodulus* (China); and *Laricobius nigrinus* (Western North America).

The best option for managing hemlock woolly adelgid in forests is biological control. Although there are natural enemies native to Eastern North America that feed on hemlock woolly adelgid, they are not effective at reducing populations enough to prevent tree mortality. Therefore, biological control opportunities using natural enemies (predators and pathogens) from the adelgid's native environment are currently being investigated. Several predators known to feed exclusively on adelgids have been imported from China, Japan, and Western North America and are slowly becoming established throughout the infested region (figure 4). It will likely take a complex of natural enemies to maintain hemlock woolly adelgid populations below damaging levels. Efforts to locate, evaluate, and establish other natural enemies continue.

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Pesticides used improperly can be injurious to humans, animals, and plants. Follow the directions and heed all precautions on the labels. NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the Federal Environmental Protection Agency, consult your county agricultural agent or State extension specialist to be sure the intended use is still registered.

Pest Alert

United States
Department of Agriculture
Forest Service
Northeastern Area
State and Private Forestry
NA-PR-09-05
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Hemlock Woolly Adelgid

Native to Asia, the hemlock woolly adelgid (*Adelges tsugae*) is a small, aphidlike insect that threatens the health and sustainability of eastern hemlock (*Tsuga canadensis*) and Carolina hemlock (*Tsuga caroliniana*) in the Eastern United States. Hemlock woolly adelgid was first reported in the Eastern United States in 1951 near Richmond, Virginia. By 2005, it was established in portions of 16 States from Maine to Georgia, where infestations covered about half of the range of hemlock. Areas of extensive tree mortality and decline are found throughout the infested region, but the impact has been most severe in some areas of Virginia, New Jersey, Pennsylvania, and Connecticut.

Hemlock decline and mortality typically occur within 4 to 10 years of infestation in the insect's northern range, but can occur in as little as 3 to 6 years in its southern range. Other hemlock stressors, including drought, poor site conditions, and insect and disease pests such as elongate hemlock scale (*Fiorinia externa*), hemlock looper (*Lambdina fiscellaria fiscellaria*), spruce spider mite (*Oligonychus ununguis*), hemlock borer (*Melanophila fulvoguttata*), root rot disease (*Armillaria mellea*), and needleminer (*Melampsora parkeri*), accelerate the rate and extent of hemlock mortality.

Hosts

The hemlock woolly adelgid develops and reproduces on all species of hemlock, but only eastern and Carolina hemlock are vulnerable when attacked. The range of eastern hemlock stretches from Nova Scotia to northern Alabama and west to northeastern Minnesota and eastern Kentucky. Carolina hemlock occurs on dry mountain slopes in the southern Appalachians of western Virginia, North and South Carolina, Georgia, and Tennessee. Eastern hemlock is also commonly planted as a tree, shrub, or hedge in ornamental landscapes. At least 274 cultivars of eastern hemlock are known to exist.

Description

The hemlock woolly adelgid is tiny, less than 1/16-inch (1.5-mm) long, and varies from dark reddish-brown to purplish-black in color. As it matures, it produces a covering of wool-like wax filaments to protect itself and its eggs from natural enemies and prevent them from drying out. This "wool" (ovisac) is most conspicuous when the adelgid is mature and laying eggs. Ovisacs can be readily observed from late fall to early summer on the underside of the outermost branch tips of hemlock trees (figure 1).

Figure 1.—Hemlock woolly adelgid ovisacs.

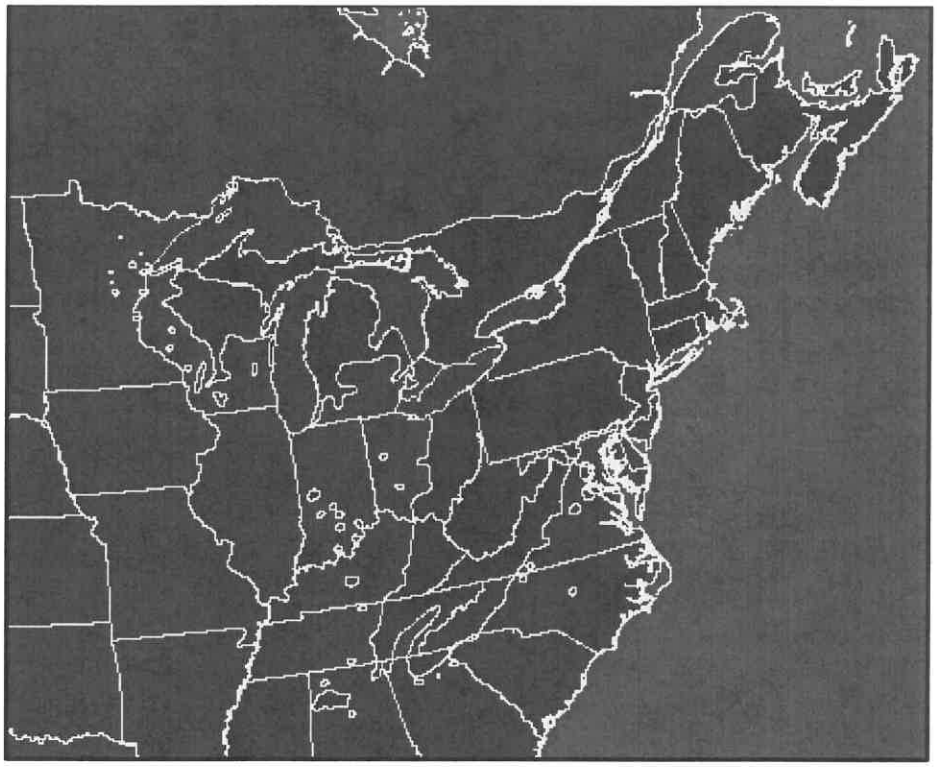
Life History

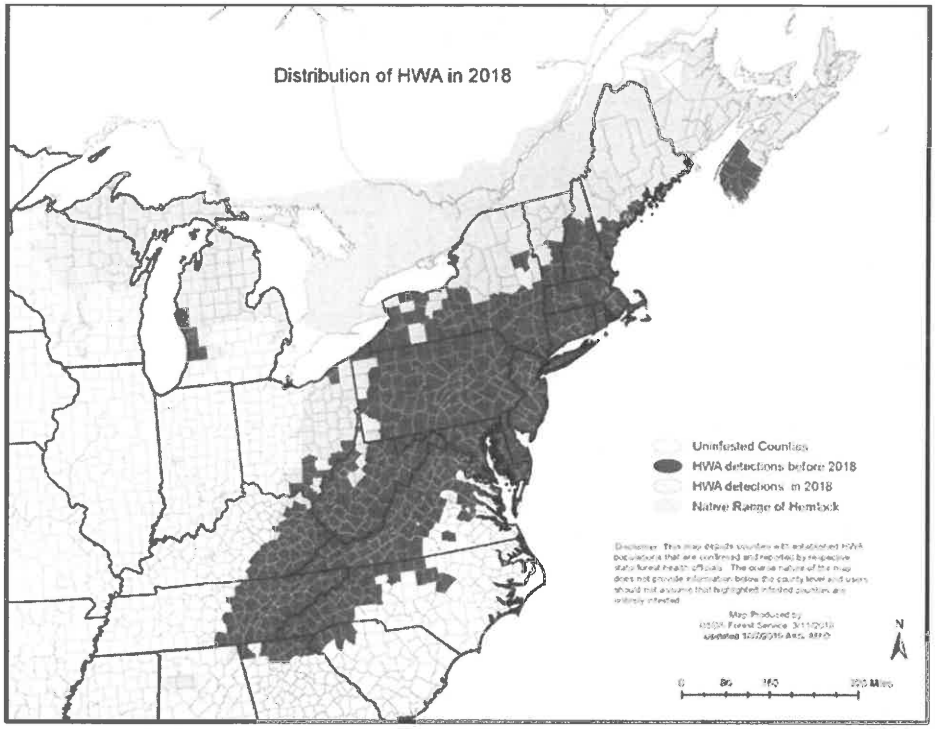
The hemlock woolly adelgid is parthenogenetic (all individuals are female with asexual reproduction) and has six stages of development: the egg, four nymphal instars, and the adult. The adelgid completes two generations a year on hemlock. The winter generation, the sistens, develops from early summer to midspring of the following year (June–March). The spring generation, the progrediens, develops from spring to early summer (March–June). The generations overlap in mid to late spring.

The hemlock woolly adelgid is unusual in that it enters a period of dormancy during the hot summer months. The nymphs during this time period have a tiny halo of woolly wax surrounding their bodies (figure 2). The adelgids begin to feed once cooler temperatures prevail, usually in October, and continue throughout the winter months.

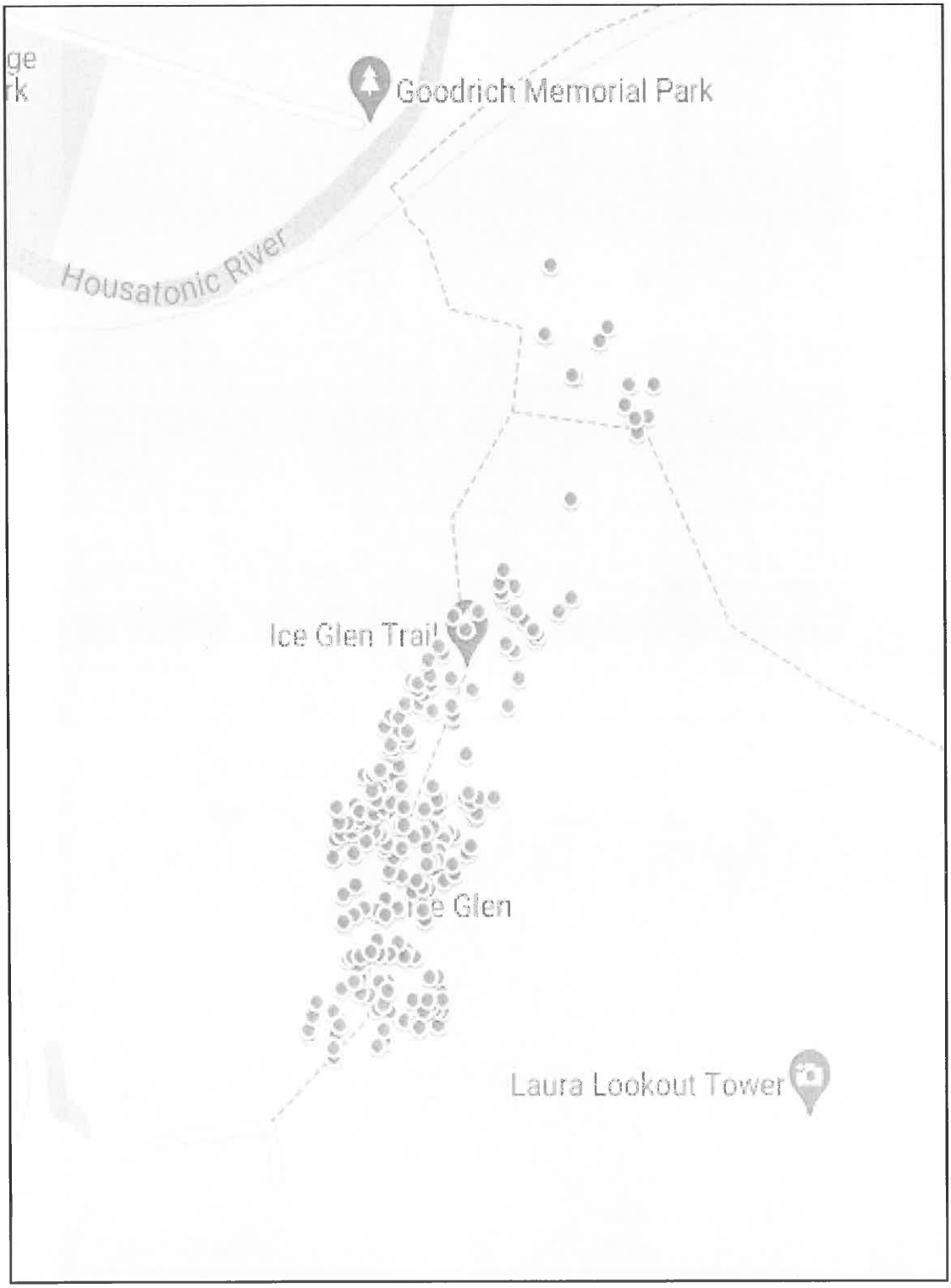
The ovisacs of the winter generation contain up to 300 eggs, while the spring generation ovisacs contain between 20 and 75 eggs. When hatched, the first instar nymphs, called crawlers, search for suitable feeding sites on the twigs at the base of hemlock needles. Once settled, the nymphs begin feeding on the young

DISTRIBUTION OF CANADIAN HEMLOCK IN EASTERN US

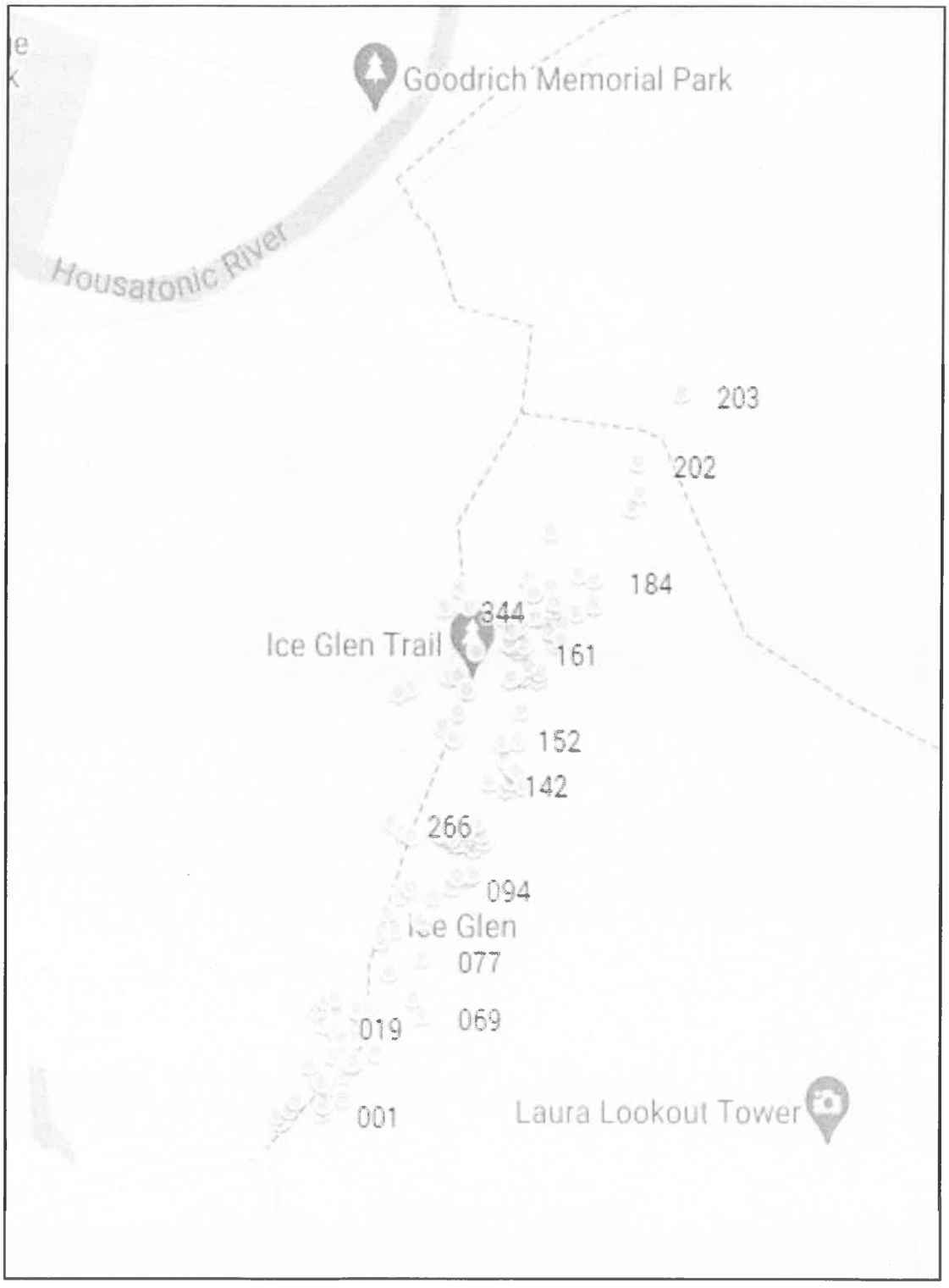




HEALTH: Poor 59%

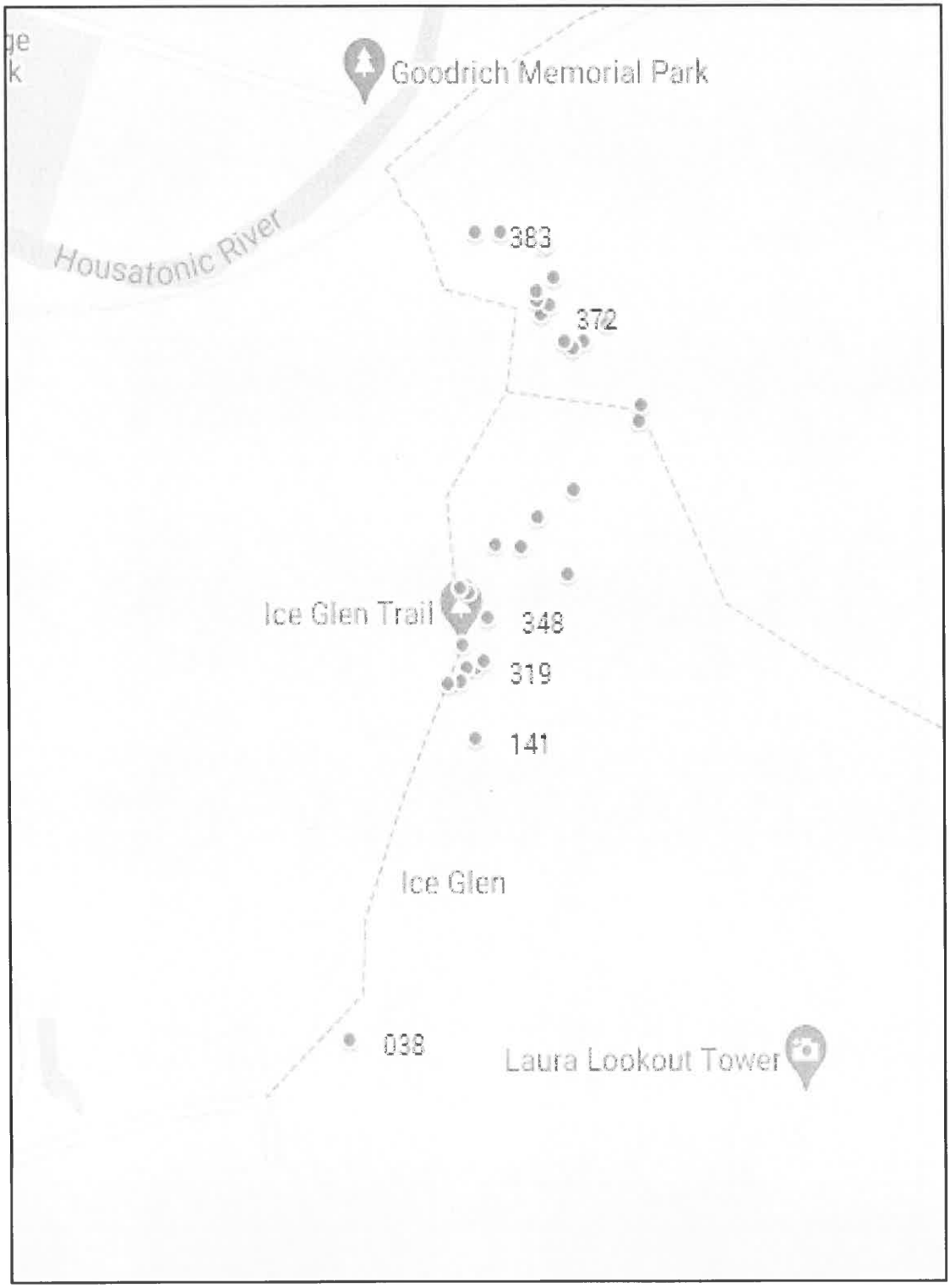


HEALTH: Fair 33%



CONDITION OF <u>ALL</u> TREES SURVEYED

HEALTH: Good 8%



The focus of current risk assessments is to determine if the presumption of reduced risk appears to be applicable to both the human health risk assessment as well as the nontarget species included in the ecological risk assessment. The potential for risks to humans in the normal use of dinotefuran appear to be low. Based on a generally conservative and protective set of assumptions regarding both the toxicity of dinotefuran and potential exposures to dinotefuran, there is no basis for suggesting that adverse effects are likely. For members of the general public, the only exposure scenarios of concern would be longer-term consumption of contaminated vegetation (foliage) after either one or two broadcast foliar applications and foliar broadcast is not an application method that is likely to be used as it would not be a practical method of treatment. I would recommend basal bark applications of the pesticide Dinotefuran as the most efficacious, cost effective treatment option available to control HWA and ELHS on the Ice Glen hemlock trees.

OPINION

Based on current data and past professional experience, it is my opinion that the hemlocks in Ice Glen face a continued decline and possible demise if an immediate pesticide treatment option is not considered. As mentioned earlier in this report my past work experience was with the DCR Forest Health Program and we performed extensive HWA and ELHS mitigation on hemlock stands throughout the state. As is the case with Ice Glen many similar pristine properties were faced with the threat of invasive insects like HWA, ELHS or EAB and the DCR was faced with the decision, do we do nothing and let nature take its course or find some way to intervene, stop the spread of an invasive insect giving trees/forests a chance to survive while other methods of intervention were studied and implemented. In closing there are several things I believe the Town of Stockbridge might consider including public perception if nothing is done. Ice Glen is a unique forested area with very large old growth hemlocks and towering white ash trees that is a popular hiking area. A high percentage of the hemlock trees are in poor condition and without pesticide intervention this year may continue to decline. This could lead to a serious hazard tree situation in the near future causing a liability issue for the town as this is an open to the public recreation area.

TREATMENT FOR HWA AND ELHS

In my past work experience as the Forest Health Program Director for the Massachusetts Department of Conservation and Recreation starting in April 2016, we were able to secure state funding to assess and chemically treat some of the more significant and pristine state-owned hemlock stands in order to protect this valuable resource. In Berkshire County this included forested acres in Bash Bish Falls, Tolland State Forest, Mohawk Trail State Forest, and Sanderson Brook Falls. We used a pesticide called Dinotefuron for the treatments which has the highest efficacy against both HWA and ELHS. Prior to these pesticide treatments we were starting to see significant decline and mortality. The pesticide treatments were quite expensive but it was realized that without intervention on our part, large stands of hemlocks would be lost which would not be ecologically sound. The US Forest Service and other eastern states are currently using the same methods of treatment to protect hemlocks.

WHITE ASH

White ash, another significant tree in our forested landscape, is also under threat from an invasive insect, the emerald ash borer (EAB).

Thirty-three white ash trees were identified, measured and documented as part of this survey. 6% are in fair condition and 93% are still in good condition.

The concern for Ice Glen is that EAB infestations are located throughout the Berkshires and have been found to be less than half a mile away. Many of the white ash in Ice Glen have been documented to be some of the oldest and largest ash trees in the state, some as tall as one hundred thirty-five (135) feet. Based on the current visual surveys performed there isn't any outright appearance of infestation but based on past experience with EAB it is more than likely in the ash trees there and could easily kill these significant trees within the next 2-3 years without intervention.

EMERALD ASH BORER

As with other invasive, non-native insects and diseases, EAB did not come to this country with natural enemies that coevolved to keep populations in check. EAB reproduces quickly and can kill a healthy ash tree in 3 to 5 years. As with HWA, there are bio-control insects being released in this country, hoping over time to get them established in order to reduce the amount of EAB. This is a process that will take many years before a natural balance is established between the EAB and its natural insect predators. In the meantime, many thousands of ash trees will die from EAB infestations. In order to protect valuable ash trees now it may be necessary to apply a pesticide treatment. Emamectrin benzoate, a systemic pesticide, has the highest efficacy against EAB and is now widely used by arborists as a control method for EAB. Specialized equipment is used to inject the pesticide into the tree.

DINOTEFURAN

In most cases the pesticide imidacloprid would be recommended as a treatment option against HWA. But because high levels of elongated hemlock scale exists on the foliage, Dinotefuran should be used as a treatment method as it basically is the only pesticide that works against ELHS.

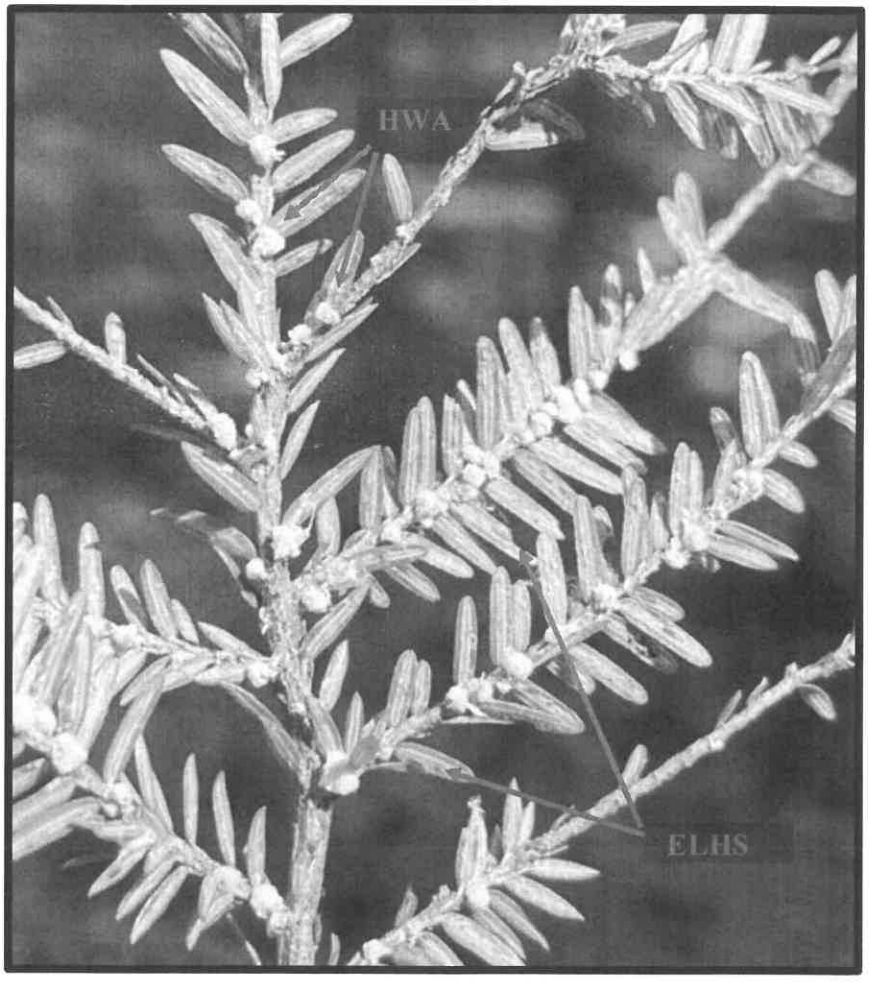
Dinotefuran is a relatively new pesticide that is considered as a possible alternative to imidacloprid for the control the HWA and ELHS. The US EPA has designated dinotefuran as a Reduced Risk alternative.

levels of HWA winter survival rates and more insect reproduction. Massachusetts for many years since the outbreak of HWA in the state was considered to be the leading edge of hemlock tree mortality in New England but that has changed and now forest health experts are predicting a more prolonged dieback of the species from this invasive insect with large amounts of decline and tree mortality expected in the future.

The US Forest Service with cooperation from HWA-affected states have a biological control program and the state of Massachusetts has been an active partner in releasing three (3) different bio-control insects on forested lands (public properties only) but unfortunately as of this date there has not been much success in getting those insects established. Because of the lack of bio-control insect establishment, many states' old growth and significant hemlock stands are starting to see an increase in symptoms of decline and tree mortality due to HWA and ELHS.

ELONGATED HEMLOCK SCALE

Elongated hemlock scale is also a non-native insect that has been found on the Ice Glen hemlocks. This insect in combination with HWA can cause needle loss, branch and limb dieback, and eventual death of trees. Currently there are no bio-control programs active in Massachusetts for this insect threat. ELHS is very difficult to control in forested stands and there are limited pesticides that actually work against this insect pest.



For overall tree health a simple good, fair, poor rating system was used. Following is an explanation for each rating:

Good condition (1) – Trees are healthy and have full crowns typical for the species. No serious bole or crown defects. Foliage transparency less than 30 percent. Minimal branch dieback.
Fair condition (2) – Trees have two or more threats to overall tree health which could include insect or disease infestations, large amounts of recent branch dieback or structural deficiencies. Transparency ratings are in the 30-50 percent range which can indicate a serious tree health concern in the future.
Poor condition (3) – Indicates a threat to overall tree health is currently occurring and without intervention tree mortality is imminent. A poor condition measurement could include serious insect or disease infestations or major structural deficiencies. Transparency ratings of greater than 50 percent.

(Note) – White ash trees during the survey were not foliated but many were determined to have a "good" tree health condition rating. This was based on the current visual condition of the trees which had minimal branch dieback and appeared to have healthy crowns.

HEMLOCKS

Hemlocks are a vital part of the New England forest landscape and are the third most prevalent tree species in Massachusetts. Hemlocks appear in pure stands and are or can be considered a riparian tree species. Environmentally, hemlocks provide erosion protection along stream banks. Hemlocks provide a habitat and a food source for birds and wildlife. In many urban areas, hemlocks are considered a major component for landscape plantings. Loss of this native tree species could be ecologically devastating to forested areas because of the benefits it provides. Three hundred and fifty-one (351) hemlocks were identified predominately along each side of the gorge. The trees were visually inspected for the presence of hemlock woolly adelgid (HWA), elongated hemlock scale (ELHS), and current health. Of the 351 hemlocks, most were in fair to poor condition. Only one hemlock was identified as in good condition, 35% are in fair condition and 64% are in poor condition.

HEMLOCK WOOLLY ADELGID

Hemlock woolly adelgid is an invasive non-native insect first discovered in the eastern United States in Richmond, VA in 1951. On its own it spreads slowly but its movement has been assisted across the eastern United States, primarily by birds and humans. The presence of HWA can be identified by the egg sacs which resemble small tufts of cotton that cling to the underside of hemlock branches. In our area it has two generations per year and each egg sac can have 100 to 300 eggs. In its native range (eastern Asia) HWA is not considered a major tree killing pest as it has coevolved with many natural enemies that keep it in check, not allowing it to become the tree killer it is in this country. In the United States the natural enemy of the HWA was not brought in thus allowing it to spread unchecked to many forested hemlock stands leading to thousands of acres of tree mortality. Up until now we have not experienced the hemlock tree mortality that's been seen to the south of Massachusetts in the southern New England, Mid-Atlantic, and southern states due to HWA. This is primarily due to our winter temperatures which normally have had periods of prolonged cold temperatures that have killed a high percentage of the insect. But recent weather conditions and possible global warming have led to higher

ICE GLEN TREE HEALTH REPORT 2021

By Ken Gooch
Ken Gooch Arboriculture Service
10 May 2021

OVERVIEW

Due to concerns about the health of hemlock and white ash trees on the 63-acre Ice Glen property in Stockbridge, Ken Gooch Arboriculture Service was contracted to conduct a tree survey to determine the current status of the trees. Hemlock trees above 10 inches DBH (diameter at breast height) within the Ice Glen area were identified, measured, and the health of each tree was determined by examining the foliage, and documented.

In addition, due to the current threat from an invasive insect, the emerald ash borer (EAB), significant white ash trees on the property were also identified, DBH measured, and current health was determined.

GPS locations for the trees measured were recorded. This documentation can be used to compare tree growth and changes in health when repeated measurements are taken over a period of time and is another method to track tree decline.

Ken Gooch is the retired director of the Massachusetts Department of Conservation and Recreation Forest Health Program and has been at the forefront of establishing strategies to monitor and mitigate the effects of long-term non-native insect and disease invasions in the forests.

DIAMETER AT BREAST HEIGHT

Diameter at breast height or DBH is a standard method of expressing the diameter of the trunk of a standing tree. DBH is one of the most common dendrometric measurements. The measurement is taken at 4.5 feet above ground level on the trunk or bole of the tree. DBH measurements are generally used to determine tree growth over long periods of time but also can be used as a forest health tool. Healthy trees depending on location in most cases have diameter measurements that increase over time. Slower than normal DBH measurements can be an indication of declining tree health. Setting up baseline DBH measurements is one tool that will allow future tree health surveys the ability to determine whether trees are recovering from the current insect infestations. In addition, DBH can be used for estimating treatment costs as most pesticide applications for hemlock woolly adelgid (HWA), elongated hemlock scale (ELHS), and emerald ash borer (EAB) are based on a cost per inch of DBH.

HEALTH RATING

There are many different methods used for determining tree health. The US Forest Service Forest Health Monitoring Program uses a tree health measurement called "Transparency" and is the main component to determine tree health. Foliage transparency is the amount of skylight visible through the live, normally foliated portion of the crown. Foliage transparency estimates the crown condition in relation to a typical tree for the site where it is found. Low transparency ratings (little visible skylight) indicate a full and generally healthy crown; high transparency ratings indicate a sparse crown. Transparency ratings of 30 percent or less are considered normal for most trees.

19. (cont. from page 2) **Brief Description of Project & Remarks**

Strategies, Objectives and Tactics

Our strategy to manage the forest amounts to the following:
1. Develop and distribute an RFP to solicit bids for treatment.
2. Evaluate proposals and select one to do the work.
3. Ongoing technical oversight, including monitoring of application of the treatment.
4. Work with forestry experts to develop and monitor a forest management and treatment plan.
5. Triage the existing situation with rapid implementation of the treatment plan.
6. Treat the ancient ash stands with emamectin benzoate via injection (completed June 2021).
7. Treat the ancient hemlock stands with dinotefuran basal bark sprays or stem injection (spring 2022).
8. Reassess tree health in three months.
9. Develop a long-term strategy to nurture the forest back to health and monitor it for future threats.

Treatment Area(s)

The Town has mapped each old-growth hemlock within the proposed treatment area. You can view the map here:

https://www.google.com/maps/d/u/0/edit?mid=1DfiuZzKPBmmLWBpOA4478AigMuerrJXX&usp=sharing

Please note that you should unclick the ashes, because we have already treated them via injection of emamectin benzoate this past June in an attempt to inoculate them against Emerald ash borer.

Timing of Treatment(s)

Spring 2022.

Pesticides, Delivery Method, and Application Rate(s)

We will use Dinotefuran due to the combination of pests attacking the hemlocks. Because of the size and concentration of the individual hemlocks, there are limits for the use of basal bark spraying as the only delivery method, because the amount of pesticide required would greatly exceed the current labeling restrictions. Therefore, we will use a hybrid methodology: we will use basal bark spray on some trees and inject the pesticide into other trees. Based on the average DBH in the stand, the application rate would be 4 mls per injection site.

Budget

We estimate the cost to treat the entire stand of old-growth hemlocks to be $175,000 to $200,000. The Town voters approved a special appropriation of $70,000 in FY2022, of which $64,000 remains. This represents approximately 1% of our General Budget, frankly an extraordinary amount for a tiny town of fewer than 2,000 residents.

In addition, town residents have already contributed more than 220 hours of volunteer time on this project, and we expect to spend at least that many more hours in the next year.

We are requesting a $70,000 match from the USDA, and will attempt to solicit donations from private sources to fund the remaining requirement.

Attachments
1. Ice Glen Tree Heatlh Report 2021, by Ken Gooch
2. Google map showing locations of hemlock trees in Ice Glen
3. Letter of Support from Bob Leverett, Friends of Mohawk Trail State Forest
4. Letter of Support from Shanon Holsey, Presidient, Stockbridge-Munsee Band of Mohicans
5. Letter of Support from Sarah RobbGrieco, Northeast Regional Manger, Old-Growth Forest Network

19. **Brief Description of Project & Remarks:** Provide a concise but detailed project description and include the following (continue on p. 3 if needed): 1) Project goals, strategies, objectives, and tactics; 2) Treatment area(s); 3) Timing of treatment(s); 4) If applicable: pesticides, delivery method, and application rate(s); and 5) Budget.

Project Goals

Ice Glen is a 70-acre tract containing an old-growth forest in the southeast corner of Stockbridge, MA. The parcel features two steep rocky cliffs that were formed at the end of the last Ice Age. We presume the difficulty to access these trees resulted in their preservation.

Ice Glen's dramatic landscape is known for the craggy moss-covered gorge, network of caves, and towering trees, many of which are over 300 years old. It is a high use area with thousands of visitors each year.

According to Bob Leverett, an acclaimed old-growth expert, there are only 1,400 acres of old growth left in Massachusetts. Ice Glen is one of the largest old growth stands on non-state property in the state. It contains hemlocks that are 200–400 years old, including the tallest hemlock (136 feet tall) and shagbark hickory in all of New England, and it is the second tallest forest in Massachusetts. It contains white ashes that are among the oldest in the state. And it contains some of the largest white pines in Massachusetts. The Ice Glen pine, probably over 300 years in age, stands 161.8 feet tall and is 13.4 feet in girth, and is one of only two in MA that combines a 13-foot circumfurence with a 160-foot height. It is the oldest white pine in the state.

It also contains trails that run right through these stands, making them accessible, at no charge, to residents and visitors alike. With the Town's support, the Stockbridge-Munsee Band of Mohicans recently conducted archaeological digs on the parcel, and found a number of home sites from well before colonial times. Nathanial Hawthorne and Herman Melville together visited Ice Glen in the mid-1800s. Melville even mentions "Icey Glen" in his American classic, Moby Dick.

The Town of Stockbridge invited three forestry experts to walk Ice Glen and do an assessment of the forest, which occurred on February 17, 2021. The experts were Bob Leverett, who is part of the Old Growth Forest Network and cofounder of the Native Tree Society, Ken Gooch, the recently retired director of forest health for the Massachusetts Department of Conservation and Recreation, and Mike Mauri, a consulting forester from Deerfield, MA. The group spent approximately three hours evaluating trees in the forest. Ken Gooch then prepared the Ice Glen Tree Health Report 2021 (attached). Using the "Transparency" method, Ken included a health rating of 351 hemlocks. Of these hemlocks, 35% were in fair condition, and 64% were in poor condition.

Ice Glen's hemlocks are being ravaged by two insects: the invasive elongate scale and the hemlock woolly adelgid. The experts predicted that, without treatment, many if not most of the old-growth hemlocks would die in the next two to three years.

The Town quickly marshalled to action, creating an inventory and assessment of old-growth hemlocks and ashes. Town leaders proposed, and the town voted to fund, $70,000 to treat these trees. We treated the ashes in June 2021, and developed the plan to treat the much larger stand of hemlocks in spring 2022.

This is a project driven not by professionals, not by experts, but by the local townspeople, who have spent hundreds of hours learning and planning how to save this treasured resource, who have appropriated local taxpayer funds to solve the problem, and who are committed to doing everything we can do save every last tree that can be saved. Volunteer hours have included on-site assessment with Bob Leverett and Ken Gooch, discussions with Tom Ryan of DCR, three Select Board meetings, a Finance Committee meeting, six Agricultural and Forestry Commission meetings, and the annual Town Meeting. Thank you for your consideration in becoming our partner in this endeavor.

FOREST HEALTH PROTECTION
COOPERATIVE (Non-Federal) LANDS FOREST PEST TREATMENT FUNDING REQUEST

1.S&PF Eastern Region	2. Agency (if applicable):	3. Organization name	4. State	5. Fiscal Year
		Town of Stockbridge	MA	22

6. Project Name: Town of Stockbridge Ice Glen Hemlock Treatment Project

7. Primary Project Goal (check only one)		8. Proposed Project Is In: (check only one)	
○	Protect Threatened/Endangered Species Habitat	○	Critical Wildlife Habitat
○	Eradicate Exotic Insect/Disease/Weed Infestation	○	Wildland/Urban Interface
○	Protect Developed Sites/High Value Trees	○	General Forest Area
○	Protect Adjacent Private Land	◉	Other (specify): second largest old growth fore
○	Protect Native Vegetation (forests and trees)	9. Project Is: (check only one)	
◉	Other (specify): Protect old-growth for	◉	Urgent (treatment must be done this year to be effective)
		○	Not Urgent

10. Primary strategy: ○ Prevention ○ Eradication ◉ Suppression ○ Restoration

11. Primary Pest(s): Hemlock woolly adelgid, elongate scale

12. Primary Host(s): Old growth forest of Tsuga canadensis/Canadian Hemlock/350–400 trees

13. No. Acres Proposed: 15–20 acres

14. Treatment Method(s): Stem injection and basal bark spray

15. Treatment Material(s) (if applicable): Dinotefuran

16. Treatment Rate(s) (if applicable): 4 mls per injection site, 20 oz per gallon for basal bark spray

17. Project Activities:	Fiscal Year Targets and Costs	
	a. Proposed Acres	b. Funding Requested ($)
(1). Treatment	15–20 acres	70000
(2). Total Funding Requested		$ 70000

18. **Project Lead**[1]: Michael Canales Title: Town Administrator Date: 10/15/2021

[1]Please provide the name of the individual who will be the primary point of contact for coordination and communication with USFS FHP staff.

Save and send as per instructions in the call letter and remember to complete the detailed project description on page 2, which can be continued onto page 3, if needed.